Guam Power Authority

Smart Grid Project

Abstract

The Guam Power Authority's (GPA) Smart Grid project involves a territory-wide deployment of advanced metering infrastructure (AMI) and implementation of distribution and substation automation equipment, which includes circuit switches, capacitors, voltage regulators, fault indicators, smart relays, and equipment sensors. Customers can install devices that assist in managing electricity use and costs, including in-home displays and home area networks. The new AMI and distribution automation technologies are intended to improve reliability and stability of GPA's electric system, reduce operating costs, and accommodate future deployment of distributed generation.

Smart Grid Features

Communications infrastructure includes the necessary meter communications and backhaul networks to enable two-way communication between the smart meters, distribution automation assets, and the head end system.

Advanced metering infrastructure includes the territory-wide deployment of more than 56,000 smart meters to both commercial and residential customers. The meters provide customers with home area network connectivity, allowing customers to install additional energy management tools such as energy management systems. The smart meters also reduce meter operations costs and electricity theft. Furthermore, GPA is integrating the AMI system with an outage management system (OMS), which includes a fully detailed circuit model integrated with supervisory control and data acquisition, meter data management system, enterprise planning system, and customer information system. GPA expects the integration of AMI and OMS to enable faster outage identification and restoration, real-time calculation of outage indices, and more efficient dispatch of field resources.

Advanced electricity service options include a Web portal that enables customers to view their electricity usage and costs so that they can better manage their consumption and bills.

At-A-Glance

Recipient: Guam Power Authority

Territory: Guam

NERC Region: N/A

Total Budget: $33,207,014

Federal Share: $16,603,507

Project Type: Advanced Metering Infrastructure and Customer Systems Electric Distribution Systems

Equipment

- **56,735 Smart Meters**
- **AMI Communication Systems**
  - **Meter Communications Network**
  - **Backhaul Communications**
- **Customer Web Portal**
- **Distribution Automation Equipment for 17 out of 64 Circuits**
  - **Distribution Management System**
  - **Distribution Automation Communications Network**
  - **Automated Distribution Circuit Switches**
  - **Automated Capacitors**

Time-Based Rate Programs

- **Time of Use**
- **Critical Peak Pricing**

Key Targeted Benefits

- **Reduced Meter Reading Costs**
- **Reduced Operating and Maintenance Costs**
- **Improved Electric Service Reliability and Power Quality**
- **Reduced Costs from Equipment Failures, Distribution Line Losses, and Theft**
- **Deferred Investment in Distribution Capacity Expansion**
- **Reduced Truck Fleet Fuel Usage**
- **Reduced Greenhouse Gas and Criteria Pollutant Emissions**

Guam Power Authority *(continued)*

Time-based rate programs include time-of-use and critical peak pricing. These rate programs are intended to reduce peak demands and provide customers with greater control over their electrical costs and bills.

Distribution automation systems include the automation of distribution feeder and substations. As part of the automation upgrade, GPA is deploying circuit switches, capacitors, voltage regulators, fault indicators, smart relays, and equipment sensors. An energy management system is being deployed to better utilize the automation assets and improve distribution system reliability and operational efficiency. In addition, an outage management system integrated with the AMI and distribution management system enables GPA to identify and respond to outages in less time.

Distribution system energy efficiency improvements involve the integration of automated capacitors with a volt/volt ampere reactive (VAR) management system. The capacitors improve volt/VAR control, power quality and distribution capacity by reducing energy losses on the distribution system.

Timeline

Key Milestones	Target Dates
AMI asset deployment begins	Q1 2012
Distribution automation asset deployment begins	Q1 2012
AMI asset deployment ends	Q1 2013
Distribution automation asset deployment ends	Q1 2013

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